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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,464	10/14/2004	Rishi Raj	013743.0104PTUS	4661

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EXAMINER	
KOSLOW, CAROL M	

ART UNIT	PAPER NUMBER
1755	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/511,464	RAJ ET AL.	
	Examiner	Art Unit	
	C. Melissa Koslow	1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7-16,18 and 19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-16, 18 and 19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

This action is in response to applicants' amendment of 24 April 2007. The amendment to the specification has overcome the objection to the specification. The supplied periodic table has overcome the 35 USC 112 second pargarph rejection. The definitions of the claim terms "group III", "group IV", "transition metal" and "lanthanoid metal" are limited to those given in the supplied periodic table. The amendments to the claims have overcome the art rejection over WO 01/38616 and the art rejection of claims 14-16, 18 and 19 over U.S. patent 4,663,229. Applicant's arguments with respect to the remaining rejections have been fully considered but they are not persuasive.

Claim 13 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

There is a question of the process of claim 7 can be practiced if one of the claimed component cannot be drawn into a fiber. Applicants need to explain how heating a mixture of a material that cannot be drawn and one that can be drawn allows for the mixture to be drawn.

Applicants' comment that the mixture can be drawn into a fiber does not explain how a material that cannot be drawn is drawable upon mixing with the second precursor. The rejection is maintained.

Claims 7-13 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for producing a composite fiber of nanoscale oxide particles dispersed in a non-oxide silicon compound matrix by mixing a organosilicon polymer and a metal alkoxide as the precursor for the oxide, heat treating the mixture to form a viscous composition, drawing the viscous composition into a fiber, thermosetting the drawn fiber into a rigid state and pyrolyzing

the resulting fiber in nitrogen or argon, does not reasonably provide enablement for producing a composite fiber of nanoscale oxide particles dispersed in a non-oxide compound matrix by mixing precursors for the oxide and non-oxide ceramics, heat treating the mixture to form a viscous composition, drawing the viscous composition into a fiber, thermosetting the drawn fiber into a rigid state and pyrolyzing the resulting fiber. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims.

The claims recite producing a composite fiber of nanoscale oxide particles dispersed in a non-oxide compound matrix by mixing precursors for the oxide and non-oxide ceramics, heat treating the mixture to form a viscous composition, drawing the viscous composition into a fiber, thermosetting the drawn fiber into a rigid state and pyrolyzing the resulting fiber. This encompasses any non-oxide as the matrix or the fiber, any precursor composition for the non-oxide and oxide and any pyrolizing atmosphere. However, the specification only teaches the use of organosilicon polymers and alkoxides as the precursors, silicon based non-oxides and pyrolyzing the resulting fiber in nitrogen or argon. Such a limited disclosure does not support the breadth of the instant claims.

Applicants' arguments are not convincing since the fact the specification teaches how to produce the claimed nanocomposite ceramic fibers using a organosilicon polymer and a metal alkoxide does not provide enablement for using any non-oxide precursor and oxide precursor. The process as claimed includes non-oxide precursors such as solid hydrocarbons, which are carbon precursors and oxide precursors, such as hydroxides or quaternary ammonium metal.

Thus the fact the specification may give guidance for polymeric precursors, it does not give enablement for all the precursors encompasses by the claims. The rejection is maintained.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 7, 9, 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 4,663,229.

This reference teaches a fiber comprising a nanophase distribution of amorphous silica and zirconia within an amorphous non-oxide ceramic. The fiber is produced by mixing an organosilicon polymer and a zirconium organometallic polymer, heating the mixture to a viscous state, drawing the viscous material into a fiber, infusing or thermosetting the fiber into a rigid state and pyrolyzing the infused fiber. The reference teaches the claimed process and fiber.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 4,663,229.

The reference teaches the infusing or thermosetting temperature is in the range of 50-400°C, overlaps the claimed range. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The reference teaches the claimed process.

Applicants' argument is not convincing since claim 7 does not teach the secondary precursor is an oxide as argued. The claim simply teaches a precursor for the oxide ceramic and the taught zirconium organometallic polymer meets this requirement. Applicants also argue the reference does not teach the claimed ceramic and states the abstract teaches an amorphous

solution of ultrafine crystalline particles of various silicon-carbon and zirconium-carbon materials. This argument is not understood since the abstract, column 1, lines 30-45 and column 13, lines 1-30 all teach fibers of containing a ultrafine particles (particle size is 50 nm or less) of silica and/or zirconia, which is a nanophase, in a matrix of amorphous silicon-zirconium carbide, which is a non-oxide ceramic. The argued heating step sets the molten mixture and thus acts as a thermosetting step. The atmosphere of claimed thermosetting step is not defined and thus does not exclude the taught step of heating in an oxidizing atmosphere. The rejections are maintained

Claims 14, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 5,350,719.

This reference teaches a ceramic material, that can be in the form of a fiber (col. 4, line 35) composed of a nitride matrix ceramic containing a dispersion of zirconia particles having a size of about 0.1-5 microns. This size range includes nanoscale particles of about 0.1 to less than 1 micron. The matrix material is produced by pyrolyzing a titanium containing disilazane. Thus it appears the nitride matrix ceramic contains Si, Ti, N and C since the silicon and all the carbon atoms are not expected to be expelled during pyrolyzation. Thus the reference suggests the claimed fiber.

Applicants' arguments are not convincing since there is no showing the taught ceramic does not contain any carbon atoms. The example simply states the material contains TiN and silicon nitride crystals. It do not state the material is only composed of these materials and there is no indication that there are no carbon or silicon impurity in the taught nitride matrix ceramic. The rejection is maintained.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cmk
May 22, 2007

C. Melissa Koslow
Primary Examiner
Tech. Center 1700